Spatial and Temporal Variations of PM10 and PM2.5

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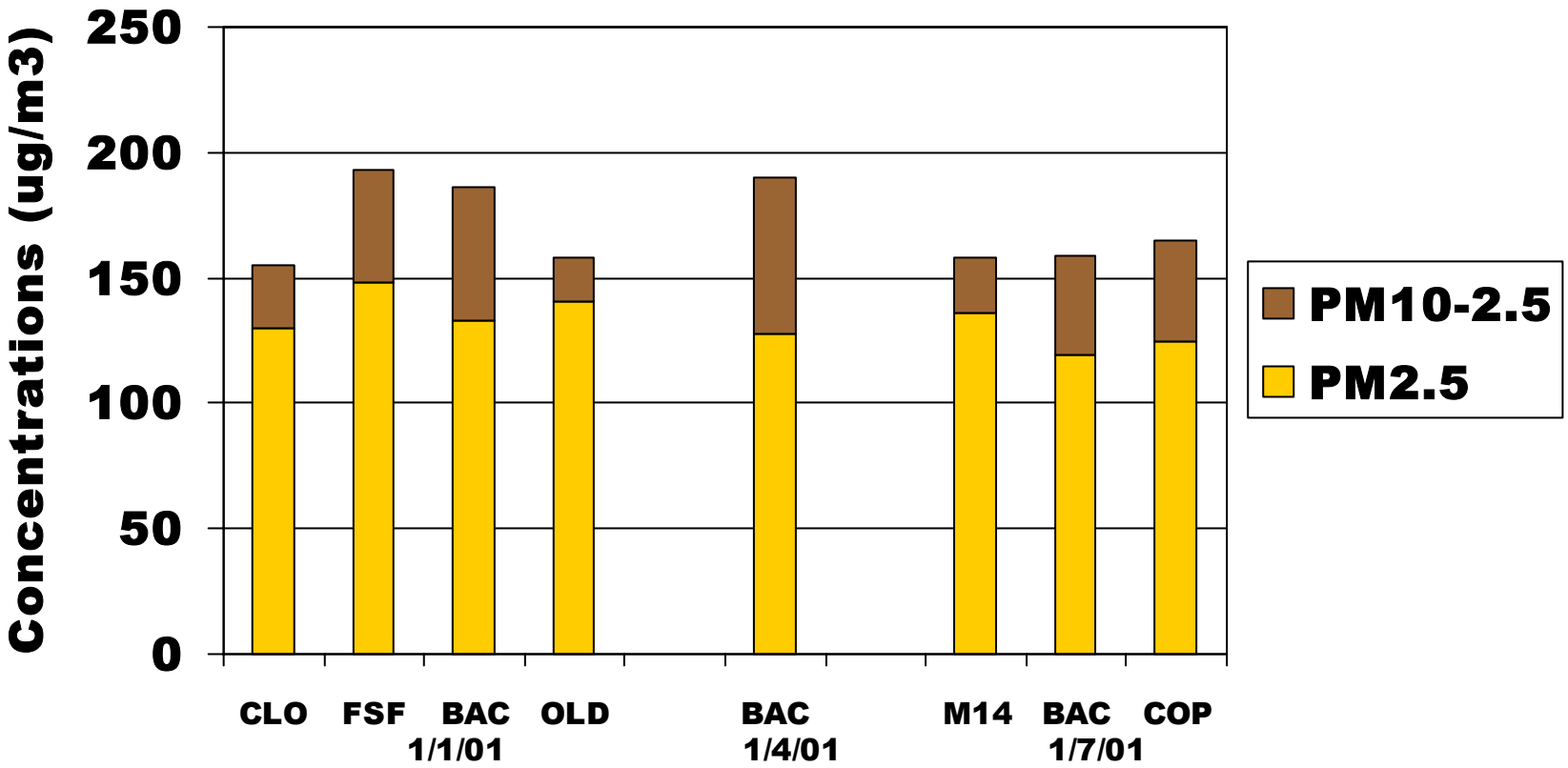
PM Episodes

Episode	Duration
December 99	12/14/99 - 1/2/00
January 2000	1/2/00 – 1/12/00
November 2000	11/15/00 – 11/29/00
December 2000	11/30/00 – 12/13/00
Dec 00/Jan 01	12/18/00 – 1/8/01
January 2001	1/12/01 – 1/24/01
Jan/Feb 2001	1/26/01 – 2/7/01

PM10 Exceedances

- Two episodes
  - December 1999
  - December 2000/January 2001
- Limited to San Joaquin Valley
- Concentrations dominated by PM2.5 mass
  - 70 to 90 %

PM10 Exceedances

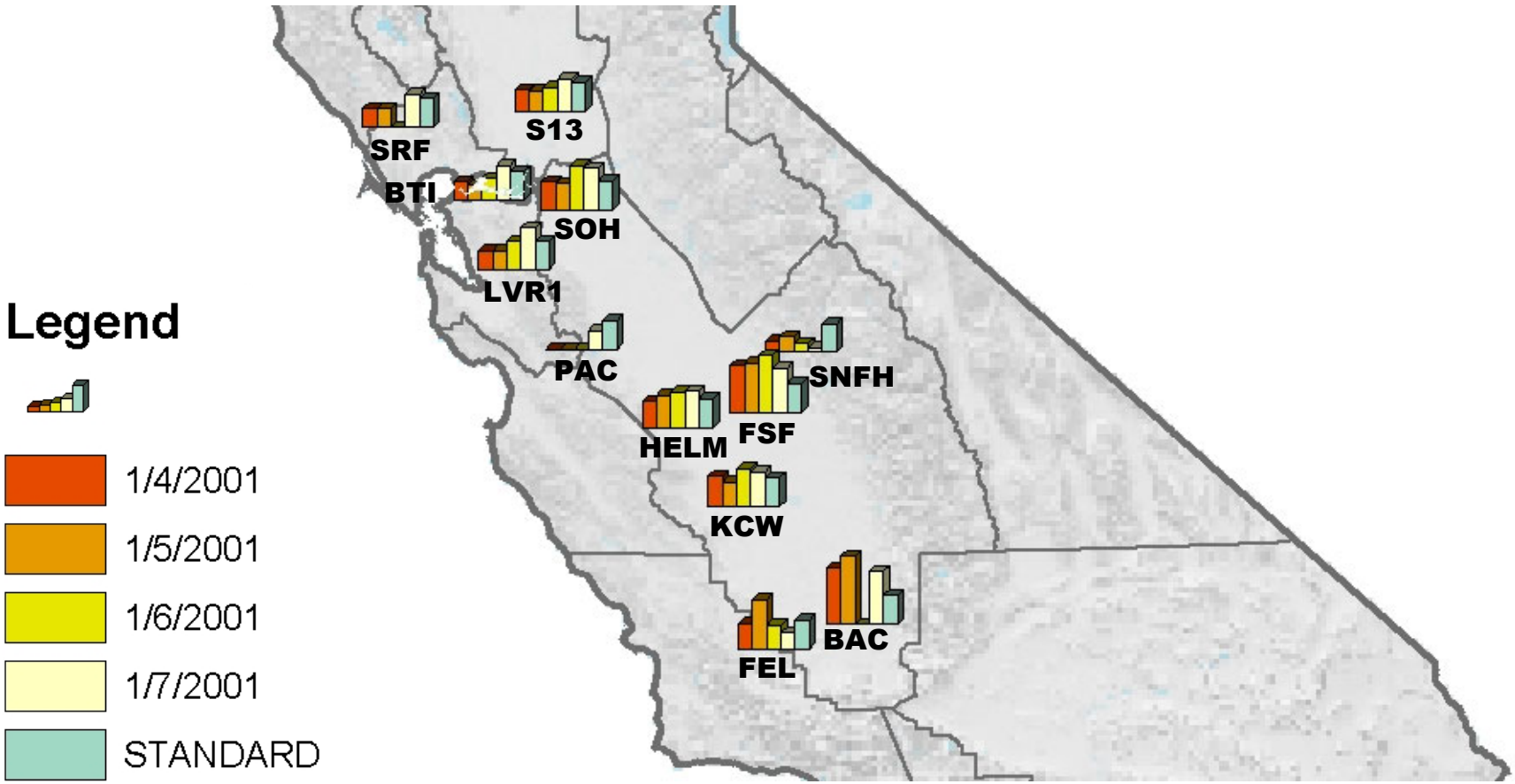


PM2.5 Exceedances

- Widespread
  - Each community exposure site affected
- Prolonged
  - Up to 18 consecutive days
- High in magnitude
  - Up to 180 $\mu g/m^3$

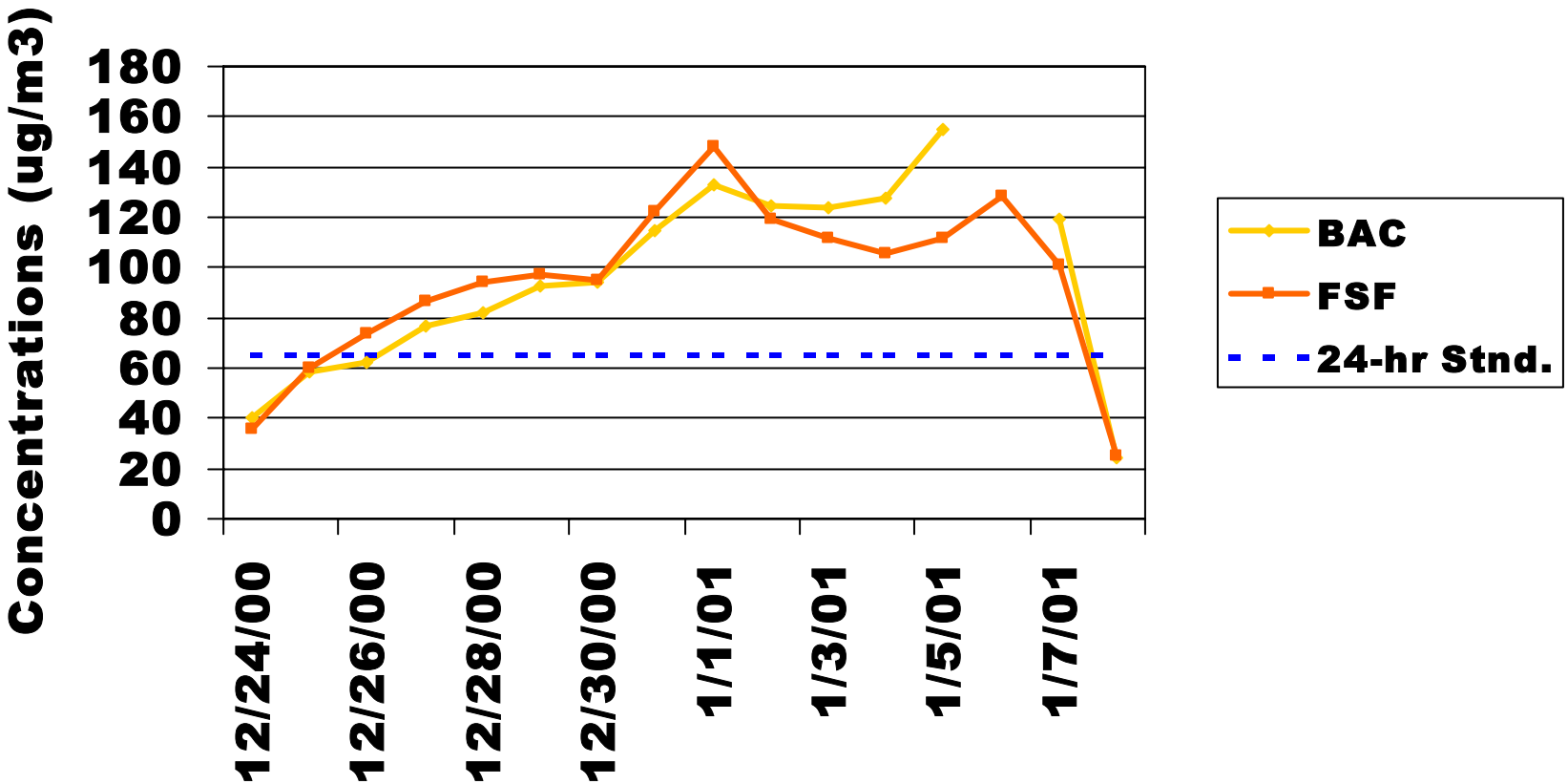
PM2.5 Concentrations

January 4-7, 2001



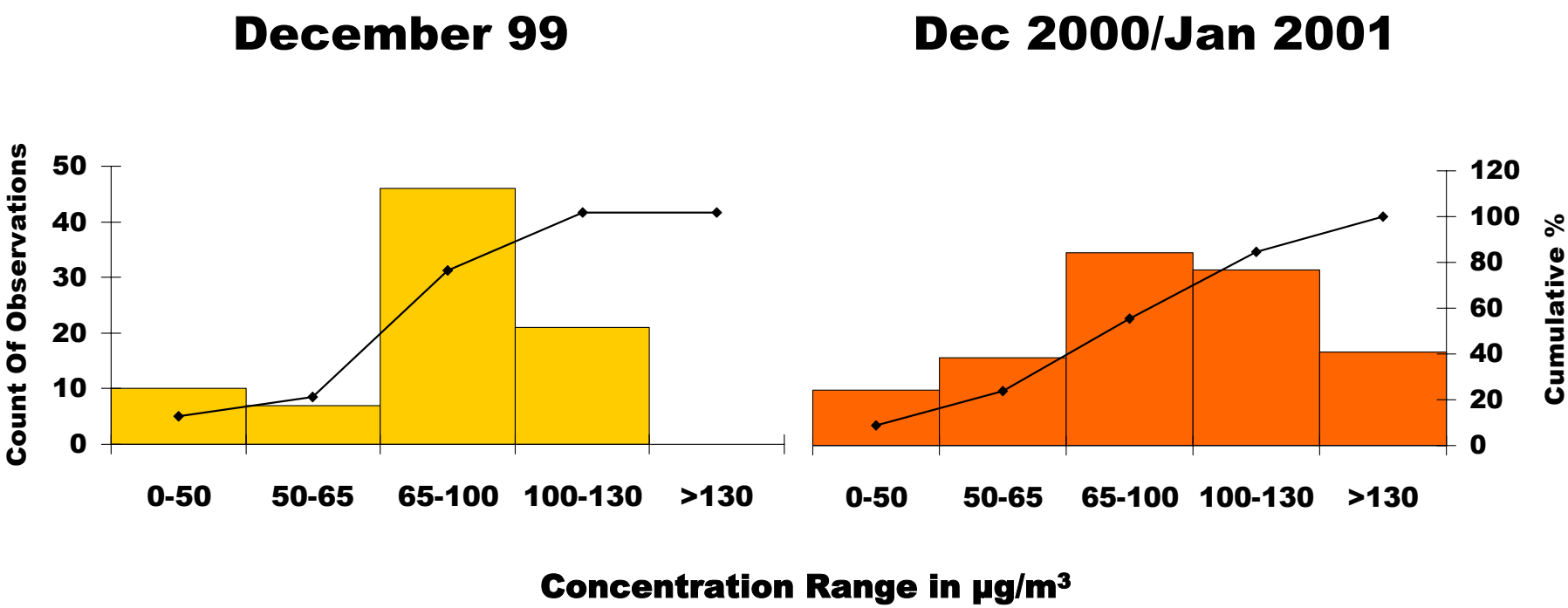
PM2.5 Concentrations

12/24/00 to 1/8/01

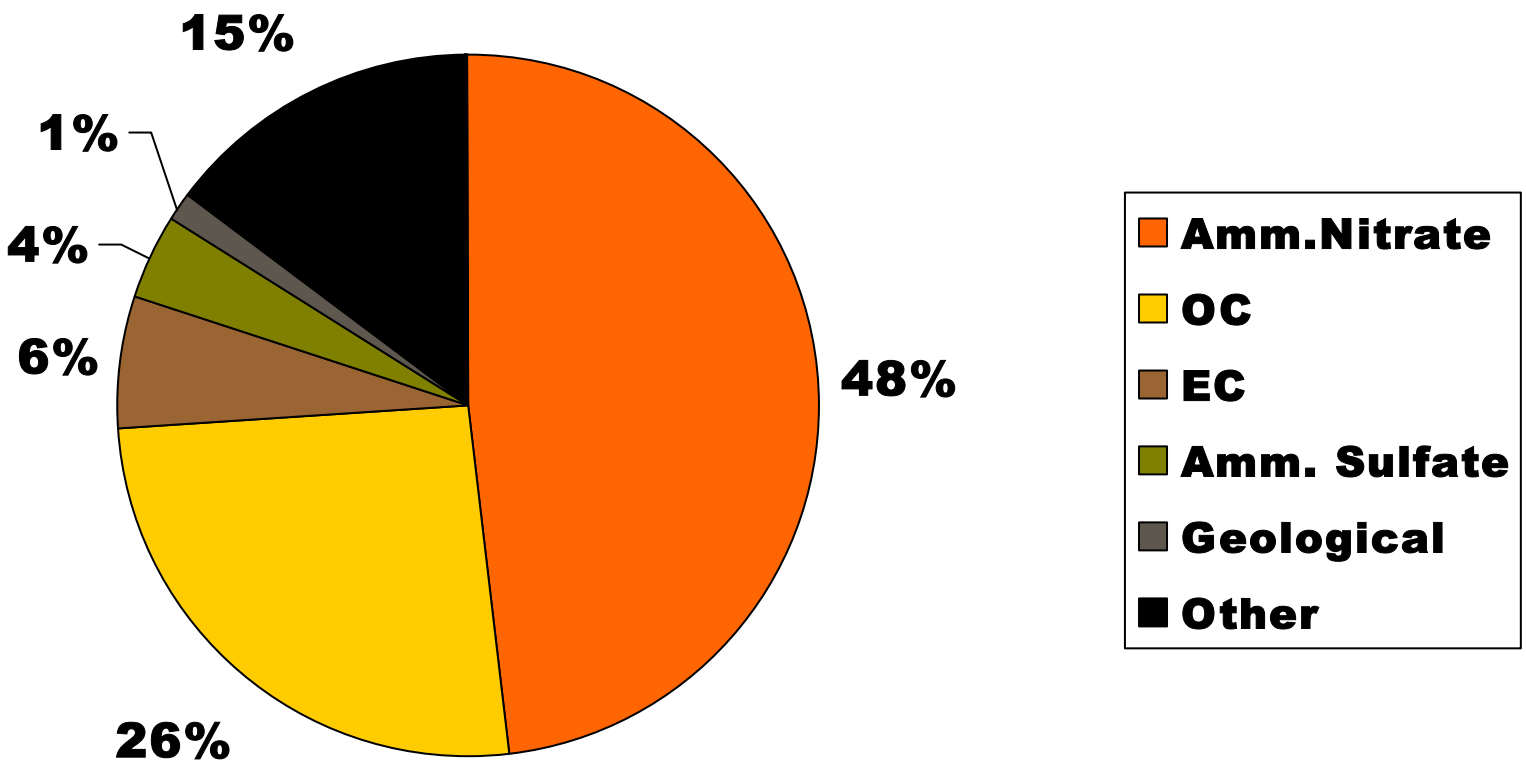


PM2.5 Concentrations

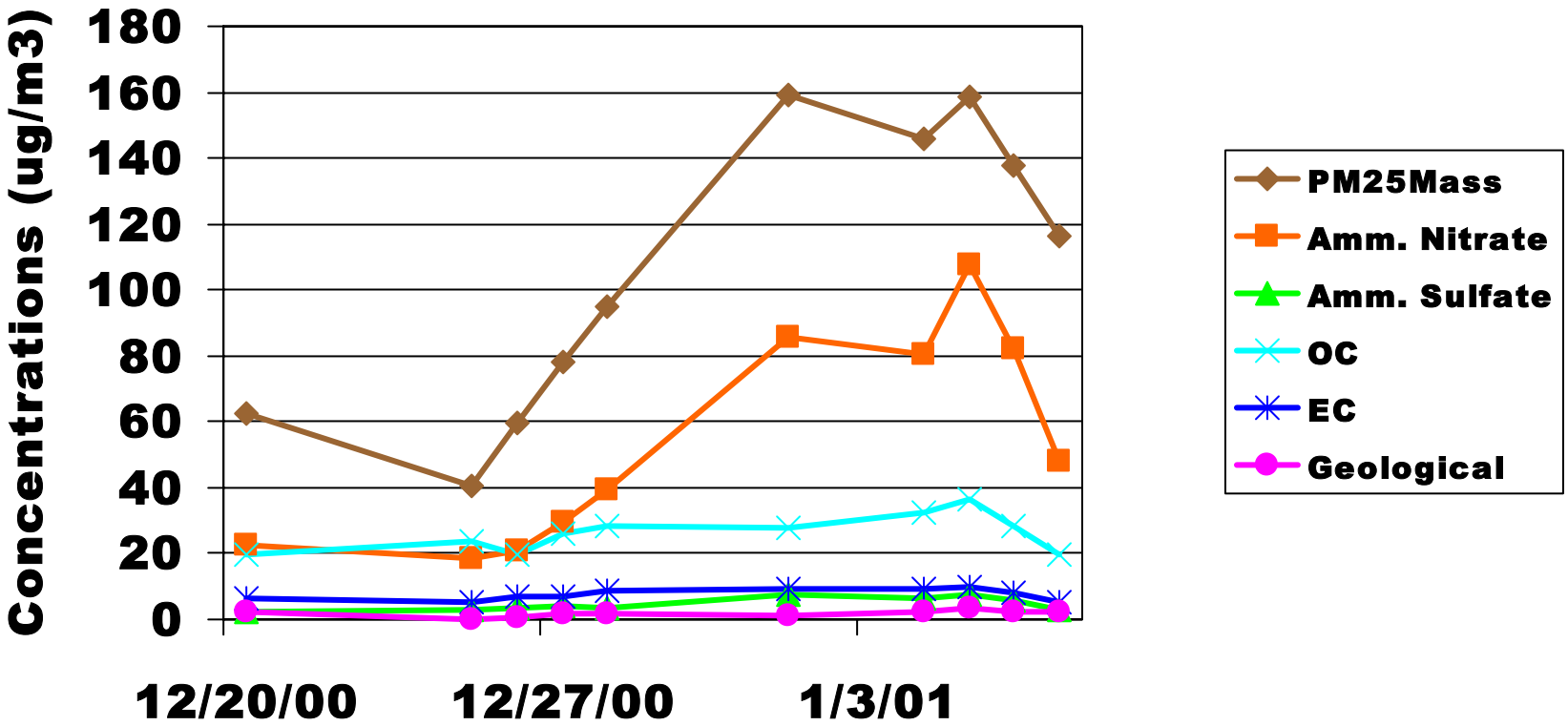
Community Monitoring Sites



Chemical Composition
Average SJV PM2.5 Exceedance

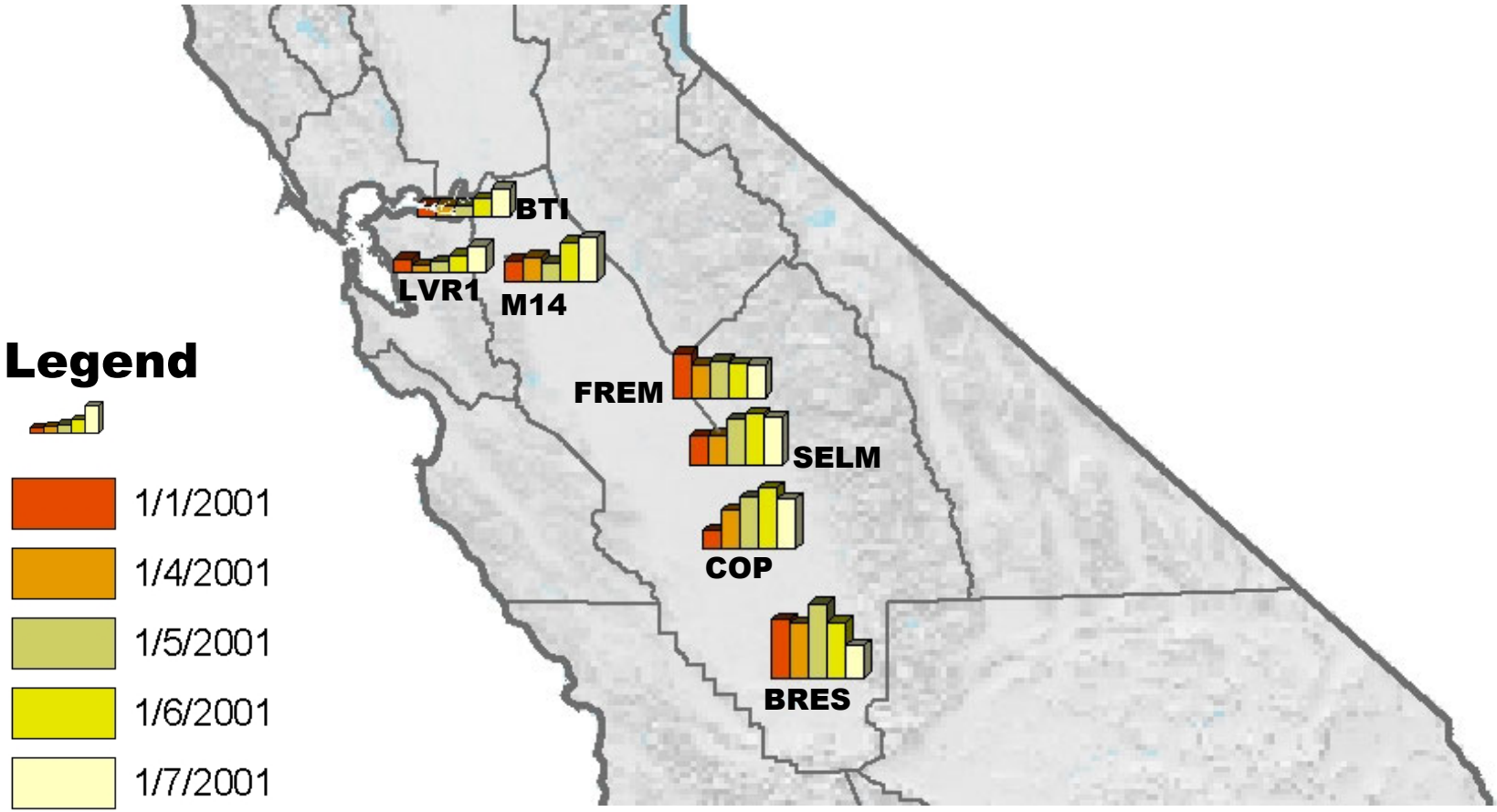


PM2.5 Concentrations Bakersfield-Residential



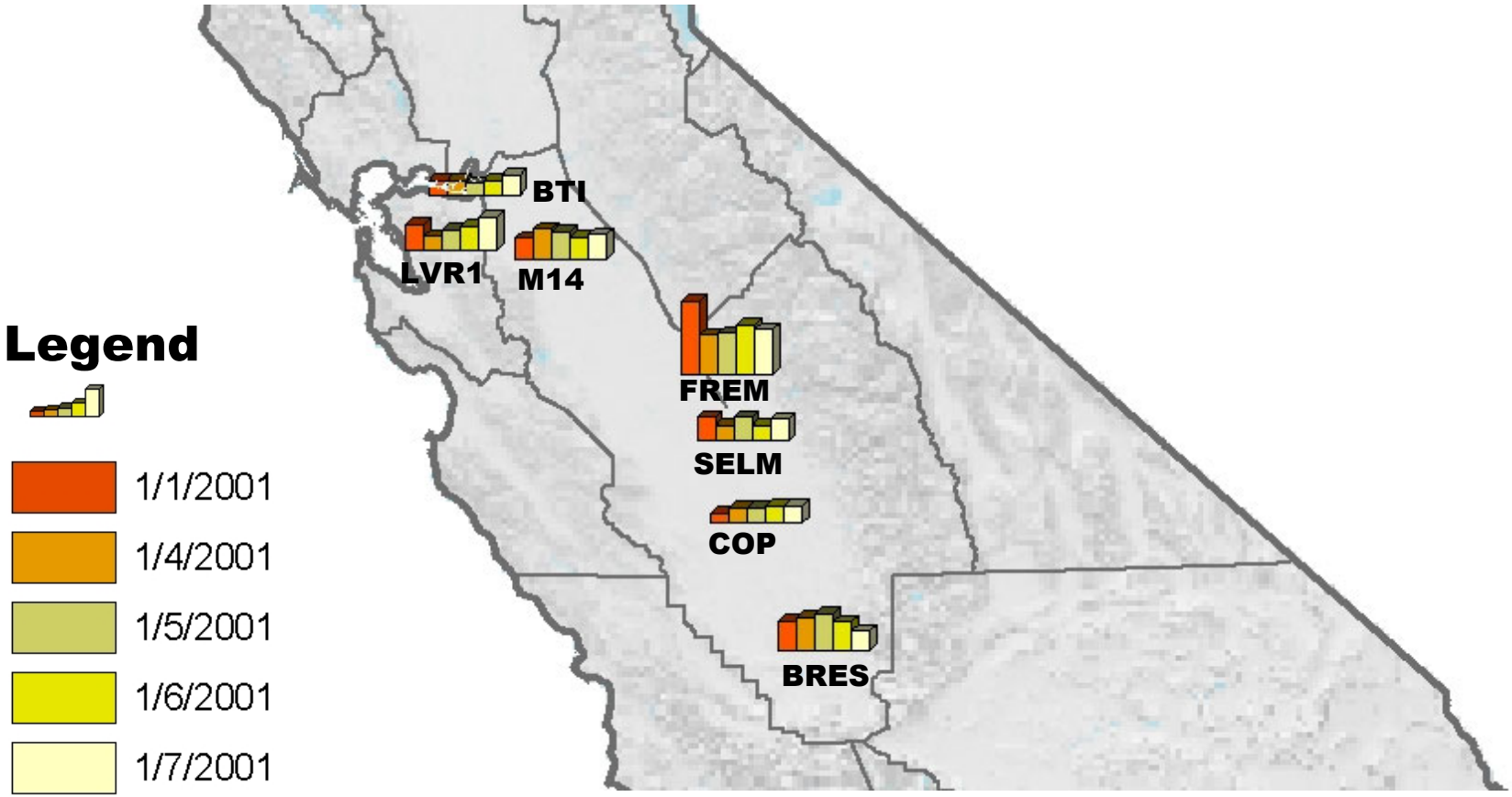
PM2.5 Ammonium Nitrate

January 1, 4, 5, 6, and 7, 2001



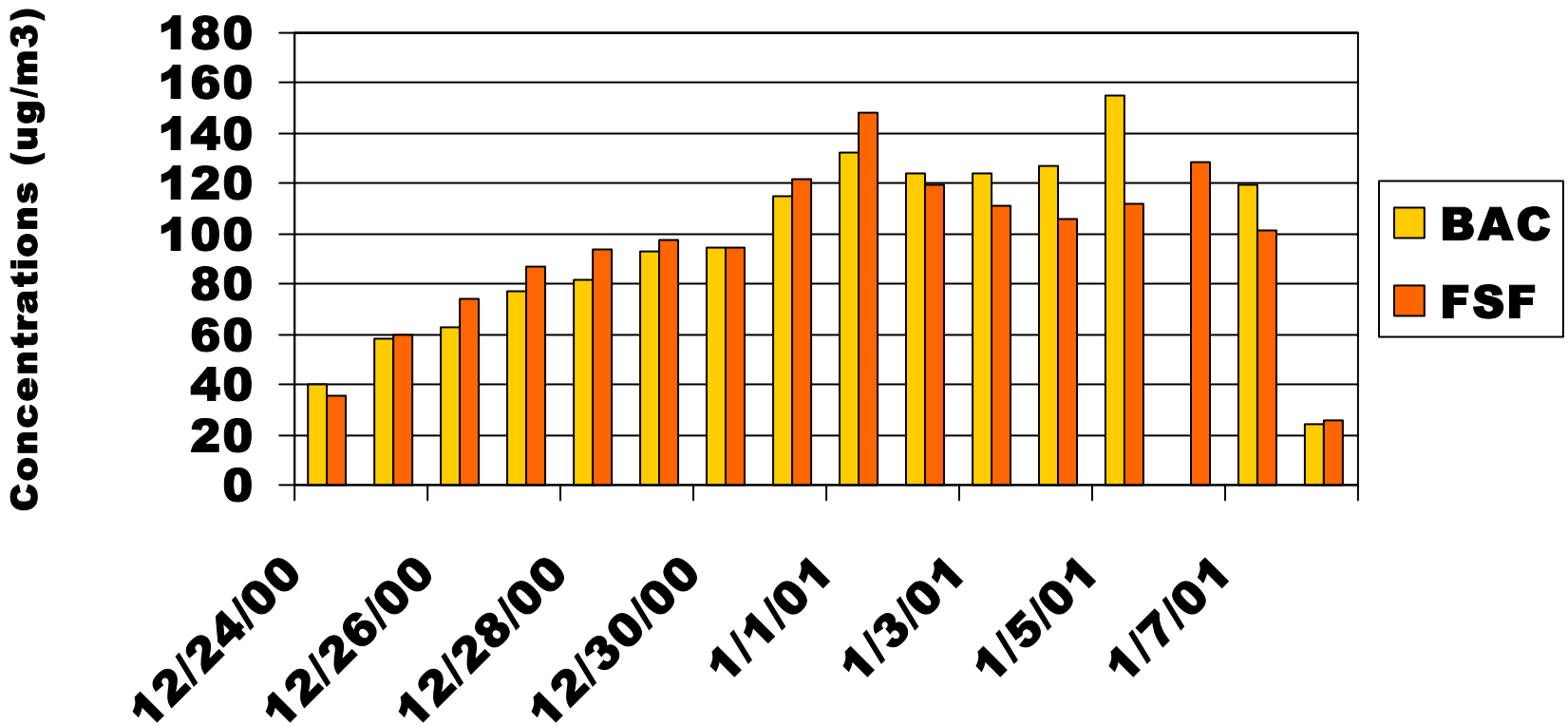
PM2.5 Total Carbon

January 1, 4, 5, 6, and 7, 2001



PM2.5 Concentrations

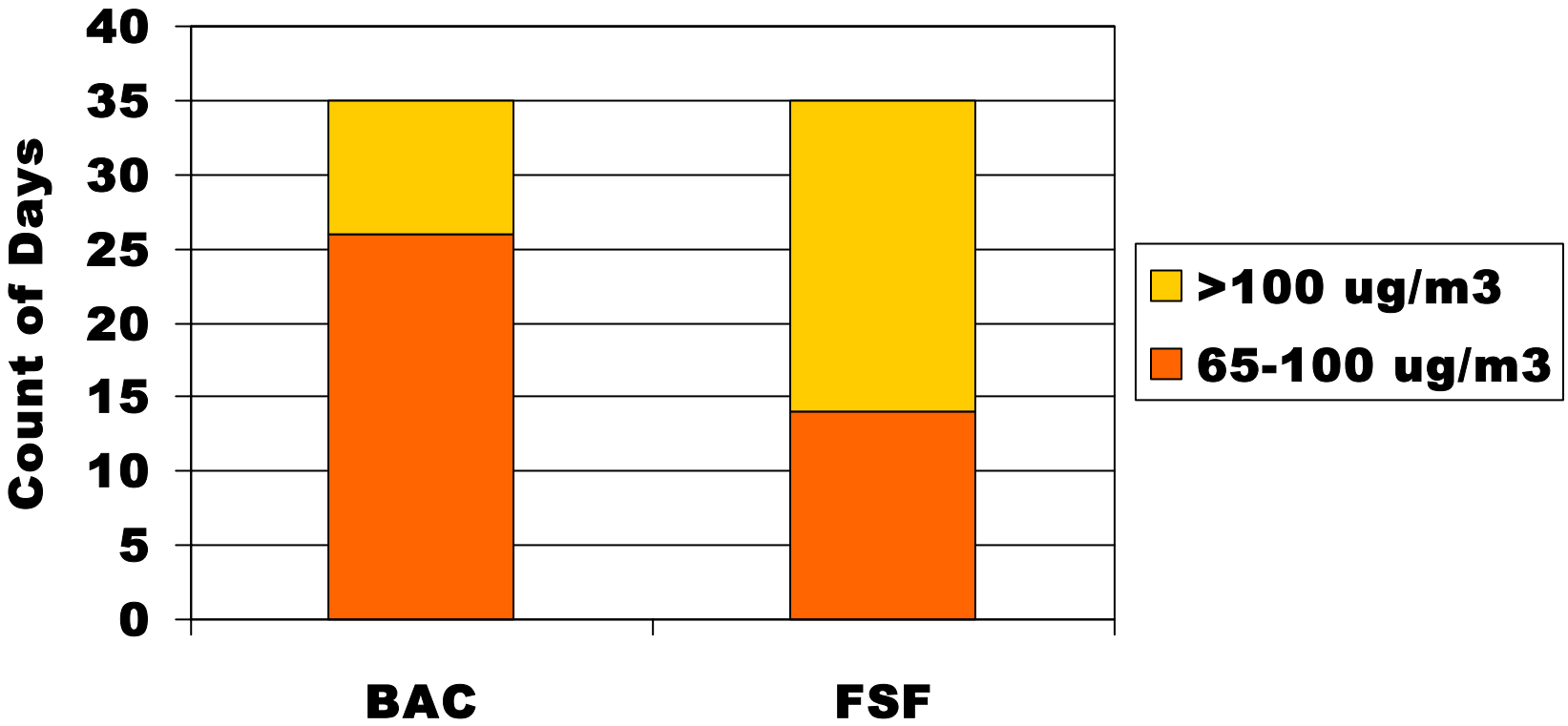
12/24/00-1/7/01



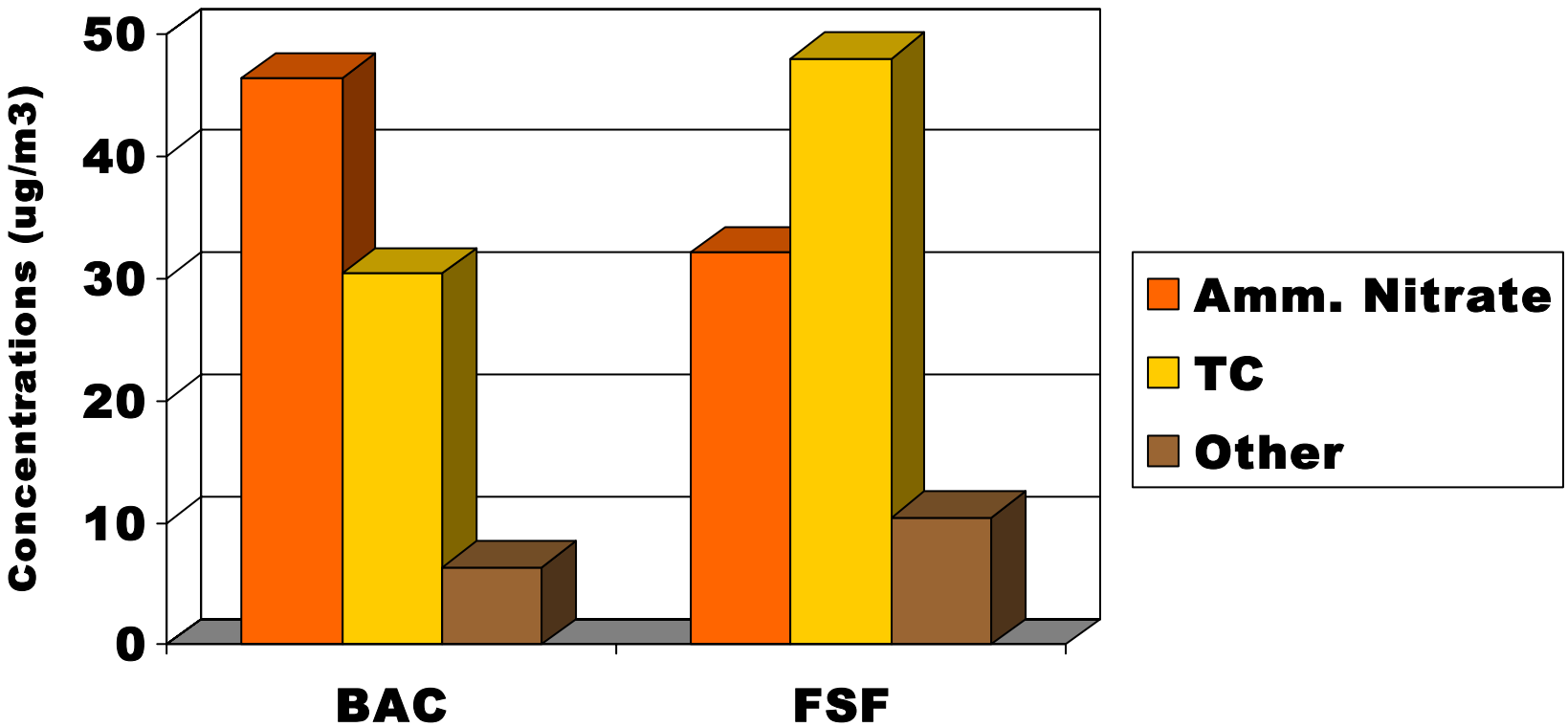
Bakersfield vs. Fresno

	BAC	FSF
Average Concentration	22 $\mu g/m^3$	22 $\mu g/m^3$
Max Concentration	155 $\mu g/m^3$	148 $\mu g/m^3$
Days >24-hr Standard	73	85
Average Exceedance	78 $\mu g/m^3$	85 $\mu g/m^3$

PM2.5 Exceedance Days Bakersfield vs. Fresno



PM2.5 Chemical Composition Average for 10 Exceedance Days



Conclusions
PM Mass

- PM2.5 problem more severe and more regional than PM10 problem
- Each episode unique
  - Area of influence
  - Strength
  - Duration
- Main PM2.5 chemical components

Conclusions
Chemical Composition

- Ammonium nitrate concentrations
  - Similar at urban and rural sites
  - Delayed peak at rural sites
  - Influenced by transport and local sources
- Total carbon concentrations
  - Always higher at urban sites than rural
  - Influenced by local sources more than transport